

S Judges' Retirement

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1992 July 1, 1992

**JUDGES' RETIREMENT SYSTEM**

**STATE OF MONTANA**

**ACTUARIAL VALUATION**

**AS OF JULY 1, 1992**

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Judges' Retirement System

State of Montana

Actuarial Valuation

As of July 1, 1992



# Judges' Retirement System

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# Judges' Retirement System

## Section I

### Introduction

An actuarial valuation of the Judges' Retirement System of the State of Montana has been completed as of July 1, 1992. This valuation was authorized by the Public Employees' Retirement Board under Section 19-5-201, MCA. The purpose of the valuation was to determine the financial position of the fund, the normal cost, and the unfunded accrued liability based upon present and prospective assets and liabilities of the system as of July 1, 1992.

Section II presents an analysis of the results of the actuarial valuation. The numerical findings and membership data supporting this analysis are shown in Section III.

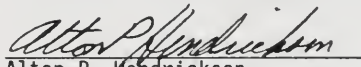
In conducting the actuarial valuation, certain assumptions were made as to the future experience of the system. A summary and discussion of each of the assumptions is contained in Section IV.

The valuation is based upon the Judges' Retirement Act and incorporates all amendments as of July 1, 1992. A summary of the major provisions of the Act is contained in Section V.

### Actuarial Certification

The results of the actuarial valuation shown in this report are based upon information provided by the Public Employees' Retirement Division regarding plan participants, plan assets and other matters. The values have been calculated on the basis of actuarial assumptions which, in my opinion, are appropriate for purposes of this valuation.

This valuation has been prepared in accordance with generally accepted actuarial principles and practices and, to the best of my knowledge, fairly reflects the actuarial position of the Judges' Retirement System as of July 1, 1992.

  
Alton P. Hendrickson  
Member, American Academy  
of Actuaries



Vol. 71, Part 1, 1941

CONTENTS

THE JOURNAL OF THE ROYAL ANTHROPOLOGICAL INSTITUTE OF GREAT BRITAIN AND IRELAND, Vol. 71, Part 1, 1941. Pp. i-100. Price 10s. 6d. (net). Published by the Royal Anthropological Institute, 21, BEDFORD SQUARE, LONDON, W.C.1.

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Vol. 71, Part 1, 1941

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## Judges' Retirement System

### Section II

#### Analysis of Valuation

##### Results of Valuation

An actuarial valuation has been conducted for the Judges' Retirement System as of July 1, 1992. This valuation has determined that the percent of each member's compensation required to fund the benefits as they accrue in the future is 41.15%. The regular contribution rate of 48.01% allows 6.85% to be applied to the unfunded past service liability. This percent is sufficient to amortize the unfunded past service liability over a period of 27.33 years.

##### Asset Valuation

Past actuarial valuations have valued assets at market value, with gain and loss fluctuations smoothed over a 6-year period. This procedure has been conservative and slow to recognize recent market performance. The current actuarial valuation has accelerated the rate at which gains and losses are recognized by smoothing the fluctuations over a shorter period of 4 years. The table below illustrates this valuation procedure:

	Actual		Adjusted
	-----		-----
Cost Value as of 6/30/92	15,929,246		15,929,246
1992 Market Gain	939,495	x .25	234,874
1991 Market Gain	321,175	x .50	160,587
1990 Market Gain	16,452	x .75	12,339
Prior Market Gain	1,017,359	x 1.00	1,017,359
	-----		-----
Market Value as of 6/30/92	18,223,727		17,354,405

##### Investment Performance

The rate of investment return during 1991-92 was 13.88% on a market value basis and 8.71% on a cost value basis. These rates were based on all assets of the system including accruals, and assumed uniform fund activity throughout the year.

##### Contributions

The contribution rate used in this valuation was 48.01%. The member's contribution is 7% of compensation, the state's is 6%, and 34.71% is to be contributed from district court fees. In addition, 1/4 of the supreme court fees are contributed to the system which represent 3.8% of each member's compensation.

Unfortunately, the district court fees produce only 22.2% of compensation. This amount is not sufficient to adequately fund the system. It is imperative that this situation be corrected. For purposes of this valuation, it was assumed that

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past funding shortfall will not be collected, but that future funding will be at the statutory funding rate.

#### Amortization of The Unfunded Liability

An amortization schedule has been prepared as part of each biennial valuation to amortize new liability gains and losses over a 40-year period. The amortization period of past liabilities decreases 2 years with each valuation. The schedule began with an initial liability established on July 1, 1984.

The Public Employees' Retirement Board has set a goal of funding liabilities over a period not to exceed 30 years. The schedule in this report illustrates the rate required to fund each valuation's new liabilities over a 30-year period.

#### Actuarial Assumptions

The actuarial assumptions used in the valuation of July 1, 1990 were continued in this valuation. A review of the system's data and experience did not reveal any deviations which warranted a change.

#### Summary of Data

The active membership was 43 on July 1, 1992. The number of active members grew by 1 with the addition of the water judge. The annual payroll increased from \$2.20 to \$2.69 million during the biennium. The average pay per member grew at the rate of 9.2% per year.

The average active member is 57.6 years of age, was employed at age 48.5, has completed 9.1 years of service, and earns \$62,474.

The number of members receiving benefits was 31 on July 1, 1992 which was an increase of 5. The annual benefit payout increased from \$515,442 to \$625,475 during the biennium. The benefit payout per member grew of 8.4% per year.

The average retiree is 75.3 years of age, retired at age 64.4 with 16.68 years of service, and receives a benefit of \$1,605 per month.

#### Conclusion

Because of increased payroll and benefit payouts, the system's total liability grew by 22.7%. This was offset by a 26.8% growth in assets. The current funding level allows the system's unfunded liability to be funded over 27.33 years. An underfunding of the system and a larger than projected payroll increase has caused this period to increase from 26.72 years in 1990. The increase was lessened because of smoothing market value changes over 4 years rather than 6.

One of the criteria for actuarial soundness is that the annual contribution be sufficient to fund the normal cost and the unfunded liability. The Judges' Retirement System provides for a contribution of 34.71% of compensation from district court fees, but the fees are insufficient to produce this contribution. Until adequate provision is made for funding the stated contribution, it is not possible to conclude that the Judges' Retirement System is actuarially sound.

1. The first part of the document is a letter from the President of the United States to the Congress, dated January 1, 1861. It is a very important document, as it contains the President's message to the Congress at the beginning of his first term.

2. The second part of the document is a report from the Secretary of the Treasury, dated January 1, 1861. It contains information about the state of the Treasury and the country's finances at the beginning of the year.

3. The third part of the document is a report from the Secretary of the Interior, dated January 1, 1861. It contains information about the state of the Interior and the country's resources at the beginning of the year.

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Judges' Retirement System

Section III

Schedule 1

Normal Cost Allocation

(1) Normal Cost Contribution Rate:

(a) Retirement	32.77%
(b) Death	3.71
(c) Disability	4.67
	-----
(d) Total Rate	41.15%

(2) Present Value of Future Salaries Of Current Members	\$ 21,775,908
(4) Present Value of Future Normal Costs For Current Members (1(d) * (2))	\$ 8,960,786

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Judges' Retirement System

Schedule 2

Present Value of Benefits

(1) Present Value of Benefits - Inactive Members

(a) Retirement	\$ 7,629,670
(b) Death	258,086
(c) Disability	1,772,783
(d) Vested	1,510,208
	-----
(e) Total Inactive	\$ 11,170,747

(2) Present Value of Benefits - Active Members

(a) Retirement	\$ 16,391,601
(b) Death	1,321,007
(c) Disability	1,615,594
	-----
(d) Total Active	\$ 19,328,202
	-----

(3) Total Liabilities	\$ 30,498,949
-----------------------	---------------



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RESEARCH REPORT

1. Title of the Report  
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3. Date of Report  
4. Abstract  
5. Introduction  
6. Experimental  
7. Results  
8. Discussion  
9. Conclusion  
10. References

11. Appendix

12. Summary  
13. Acknowledgments  
14. Bibliography  
15. Index  
16. Glossary  
17. Figures  
18. Tables  
19. Footnotes  
20. Endnotes

# Judges' Retirement System

## Schedule 3

### Liability Allocation and Statutory Funding

#### (1) Unfunded Past Service Liability

(a) Present Value of Benefits	\$ 30,498,949
(b) Present Value of Future Normal Costs	\$ 8,960,786
(c) Fund Assets	\$ 17,354,405
	-----
(d) Unfunded Liability (a)-(b)-(c)	\$ 4,183,758

#### (2) Contribution Rates Amortized over 27.33 Years

(a) Present Value of Salaries During Next 27.33 Years	\$ 60,987,742
(b) Unfunded Contribution Rate (1(d)/2(a))	6.86%
(c) Normal Cost Rate (Schedule 1)	41.15
	-----
(d) Statutory Funding Rate	48.01%



# Judges' Retirement System

## Schedule 4

### Unfunded Liability Amortization Schedule

#### (1) Biennial Unfunded Past Service Liability Accounts

1984 Liability Account as of 7/1/90	\$	10,057,128
Interest Charge on Liability Account		1,673,506
Contributions Applied to Liability		-644,736
Interest Credit on Contributions		-49,723
1984 Liability Account as of 7/1/92	\$	12,425,093
1986 Liability Account as of 7/1/90	\$	-3,137,023
Interest Charge on Liability Account		-522,001
Contributions Applied to Liability		201,106
Interest Credit on Contributions		15,510
1986 Liability Account as of 7/1/92	\$	-3,875,640
1988 Liability Account as of 7/1/90	\$	-2,174,660
Interest Charge on Liability Account		-361,863
Contributions Applied to Liability		139,412
Interest Credit on Contributions		10,752
1988 Liability Account as of 7/1/92	\$	-2,686,687
1990 Liability Account as of 7/1/90	\$	-1,380,965
Interest Charge on Liability Account		-229,793
Contributions Applied to Liability		88,530
Interest Credit on Contributions		6,828
1990 Liability Account as of 7/1/92	\$	-1,706,116

#### (2) Actuarial Gain/Loss

Current Unfunded Liability (Schedule 3)	\$	4,183,758
Less 1984 Liability Account		12,425,093
Less 1986 Liability Account		-3,875,640
Less 1988 Liability Account		-2,686,687
Less 1990 Liability Account		-1,706,116
		-----
1992 Liability Account as of 7/1/92	\$	27,108

#### (3) Required Contribution Rate

Normal Cost Rate (Schedule 1)	41.15%
Rate to Fund 1984 Liability Over 22 Years	24.44
Rate to Fund 1986 Liability Over 24 Years	-7.08
Rate to Fund 1988 Liability Over 26 Years	-4.59
Rate to Fund 1990 Liability Over 28 Years	-2.74
Rate to Fund 1992 Liability Over 30 Years	0.04
	-----
Contribution Rate for 30-Year Schedule	51.22%

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13. Summary	14. Conclusions	15. Recommendations	16. Appendixes
17. Bibliography	18. Index	19. Glossary	20. Notes

# Judges' Retirement System

## Schedule 5

### Comparison of Valuations

	1990	1992
	-----	-----
(1) Unfunded Past Service Liability		
(a) Present Value of Benefits	\$24,864,038	\$30,498,949
(b) Present Value of Future Costs	\$ 7,811,405	\$ 8,960,133
(c) Fund Assets	\$13,688,153	\$17,354,405
(d) Unfunded Liability	\$ 3,364,480	\$ 4,184,411
(2) Amortization Period and Contribution Rates		
(a) Years for Amortization	26.72	27.32
(b) Unfunded Contribution Rate	6.87%	6.85%
(c) Normal Cost Rate	41.26%	41.15%
(d) Statutory Funding Rate	48.13%	48.01%
(3) Active Members		
(a) Number of Members	42	43
(b) Annual Payroll	\$ 2,199,120	\$ 2,686,371
(c) Average Annual Salary	\$ 52,360	\$ 62,474
(4) Inactive Members		
(a) Number of Retired	20	26
(b) Number of Disabled	5	4
(c) Number of Survivors	1	1
(d) Number of Vested Deferred	5	4
(e) Annual Benefits	\$ 515,442	\$ 625,475
(f) Average Monthly Benefit	\$ 1,652	\$ 1,681



# Judges' Retirement System

## Schedule 6

Table 1

### Number of Active Members

Years of Service	Member's Age									Total
	20-25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	OVER 60	
0-4					4	6		3	1	14
5-9					1	3	2	2	8	16
10-14						1	1		5	7
15-19									2	2
20-24									1	1
25-29									2	2
30-34									1	1
35-39										
40-UP										
Total					5	10	3	5	20	43





# Judges' Retirement System

Table 2

## Average Salaries of Active Members

Years of Service	Member's Age									Total
	20-25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	OVER 60	
0-4					58328	58221		58009	58009	58191
5-9					58009	61232	62844	62844	63188	62412
10-14						67678	67678		66041	66509
15-19									67678	67678
20-24									67678	67678
25-29									67678	67678
30-34									69162	69162
35-39										
40-UP										
Total					58264	60070	64455	59943	65063	62474



# Judges' Retirement System

Table 3

Number of Vested Inactive Members

Years of Service	Member's Age									Total
	20-25	25-29	30-34	35-39	40-44	45-49	50-54	55-59	Over 60	
0-4										
5-9							1			1
10-14						1			1	2
15-19									1	1
20-24										
25-29										
30-34										
35-39										
40-UP										
Total						1	1		2	4



# Judges' Retirement System

Table 4

Number of Retired Members

Member's Service	Recipient's Age									Total
	< 45	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Over 80	
0-4										
5-9						2		2		4
10-14						1	3		1	5
15-19				1		1	2	4	2	10
20-24								2	1	3
25-29						1	1		1	3
30-34									1	1
35-39										
40-UP										
Total				1		5	6	8	6	26

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# Judges' Retirement System

Table 5

## Average Benefits of Retired Members

Member's Service	Recipient's Age									Total
	< 45	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Over 80	
0-4										
5-9						1058		911		984
10-14						1470	1709		1790	1677
15-19				2613		2055	1672	973	1641	1519
20-24								2162	2150	2158
25-29						2793	1254		2215	2087
30-34									1489	1489
35-39										
40-UP										
Total				2613		1687	1621	1255	1821	1605



MEMORANDUM FOR THE RECORD

DATE: 10/10/54

TO: Mr. Tolson, Mr. Boardman, Mr. Nichols, Mr. Belmont, Mr. Ladd, Mr. Clegg, Mr. Glavin, Mr. Harbo, Mr. Rosen, Mr. Tracy, Mr. Egan, Mr. Gurnea, Mr. Hendon, Mr. Pennington, Mr. Quinn, Mr. Nease, Mr. Gandy

FROM: Mr. Clegg

SUBJECT: [Illegible]

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# Judges' Retirement System

Table 6

## Number of Disabled Members

Member's Service	Recipient's Age									Total
	< 45	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Over 80	
0-4										
5-9										
10-14						1				1
15-19								1		1
20-24						1				1
25-29								1		1
30-34										
35-39										
40-UP										
Total						2		2		4

1998

1999

2000

2001

2002

2003

2004

2005

2006

2007

2008

2009

2010

2011

2012

# Judges' Retirement System

Table 7

## Average Benefits of Disabled Members

Member's Service	Recipient's Age									Total
	< 45	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Over 80	
0-4										
5-9										
10-14						2014				2014
15-19								2022		2022
20-24						2351				2351
25-29								3008		3008
30-34										
35-39										
40-UP										
Total						2183		2515		2349



# Judges' Retirement System

Table 8

## Number of Survivors

Member's Service	Recipient's Age									Total
	< 45	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Over 80	
0-4										
5-9						1				1
10-14										
15-19										
20-24										
25-29										
30-34										
35-39										
40-UP										
Total						1				1

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# Judges' Retirement System

Table 9

## Average Benefits of Survivors

Member's Service	Recipient's Age									Total
	< 45	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Over 80	
0-4										
5-9						991				991
10-14										
15-19										
20-24										
25-29										
30-34										
35-39										
40-UP										
Total						991				991





## Judges' Retirement System

### Section IV

#### Actuarial Funding Method

The cost of the retirement system will be determined by its future experience. In calculating the financial requirements of the fund, certain assumptions were made as to the expected future experience. This section summarizes the funding method applied as well as the actuarial assumptions used.

Any variations in the actual experience of the fund from those assumed in this valuation may cause changes in the projected future costs of the fund. It is therefore necessary that the actuarial assumptions be reviewed from time to time with adjustments as experience warrants. It is also important that regular valuations be performed to determine the financial effect of variations between the actual and assumed experience.

The assumptions used in the valuation are based upon the past experience of the fund together with projections as to future experience.

The method of funding employed is commonly referred to as the entry age normal cost method. This method establishes a normal cost as well as an unfunded accrued liability. The normal cost is the level percentage of total salaries required to fund the benefits, assuming this percentage has been contributed since each member's entry into the fund.

The unfunded accrued liability represents the excess of the present value of total liabilities over the present value of the fund assets and the present value of expected future contributions at the normal cost rate.

In order to maintain the fund on an actuarially sound basis, the rate of contribution should be such as to provide for the normal cost in addition to making progress towards the amortization of the unfunded liability.

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Volume 100, Part 1, 2000  
The Journal of the Royal Anthropological Institute is a peer-reviewed journal of research in human evolution, primatology, and human biology. It is published quarterly by the Royal Anthropological Society. The journal covers a wide range of topics, including the evolution of the human species, the development of the human brain, and the social and cultural evolution of humans. It is a leading journal in the field of human evolution and is read by researchers and students alike.

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**Judges' Retirement System**  
**Discussion of Actuarial Assumptions**

Mortality Rates

The mortality rates for males and females are based upon the 1983 Group Annuity Mortality Table, and apply to both active members and those receiving benefits.

Disability Rates

The disability rates for males and females are based upon the 1983 Disability Table.

Withdrawal Rates

It was assumed there would be no member withdrawals.

Salary Scale

The rates of salary increase are based upon an assumed compounded growth rate of 6.5% per annum.

Investment Earnings

It was assumed that the investment earnings would be 8% compounded annually.

Asset Valuation

The assets are based on market value, with gains and losses graduated over a 4-year period.

Administrative Expenses

It was assumed that the system would incur no administrative expenses beyond those provided by investment earnings in excess of 8%.

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**Judges' Retirement System**  
**Illustration of Actuarial Assumptions**

**Mortality Rates**

The mortality rates are based upon the 1983 Group Annuity Mortality Table.

Age	Deaths Per 10,000 Male Members	Deaths Per 10,000 Female Members
25	5	3
30	6	3
35	9	5
40	12	7
45	22	10
50	39	16
55	61	25
60	92	42
65	156	71
70	275	124
75	446	240
80	741	429
85	1,148	699

**Disability Rates**

The disability rates are based upon the 1983 Disability Table.

Age	Disabilities per 10,000 Male Members	Disabilities per 10,000 Female Members
25	1	1
30	2	3
35	3	5
40	6	9
45	12	15
50	20	22
55	51	41
60	105	87



### Salary Scale

The salary increases are based upon an assumed compounded growth rate of 6.5% per annum.

### Investment Earnings

Future investment earnings are assumed to be 8% compounded annually.

### Asset Valuation

The assets are based on market value, with gains and losses graduated over a 4-year period.

### Administrative Expenses

It was assumed that the administrative expenses would be recovered by investment earnings in excess of 8%.





## Judges' Retirement System

### Section V

#### Summary of Benefits and Contributions

Employee Contributions -	7% of member's compensation.
State Contributions -	6% of members' compensation.
Court Contributions -	34.71% of member's compensation plus 1/4 of supreme court fees.
Retirement Benefit -	<p>Eligibility: Age 65 and 5 years of service.</p> <p>Normal Form: Life payments with a death benefit equal to the present value of the benefit at retirement less payments made up to the date of death.</p> <p>Benefit: 3.333% of the final compensation for each of the first 15 years of service and 1.785% for each additional year.</p>
Disability Benefit -	<p>Service Disability: 50% of final compensation.</p> <p>Nonservice Disability: If after age 60, then the accrued benefit. If prior to age 60, then the actuarial equivalent of the accrued benefit based on retirement at age 65.</p>
Death Benefit -	<p>Service Death: Accrued benefit commencing at time of death.</p> <p>Nonservice Death: Actuarial equivalent of the accrued benefit based on retirement at age 65.</p>
Termination Benefit -	Prior to 5 years of service, return of member contributions. After 5 years, the member may elect to receive the accrued benefit at age 65.
Benefit Adjustments -	Retirement benefits are increased at the same rate compensation is increased to active members.

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